Name: Date:

Polynomial Factoring solution (version 640)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 60 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(60)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 240}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-96}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{12 \pm 4\sqrt{6}\, i}{2}$$

$$x = 6 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 9i$ and $4 - 2i$ in standard form ($a + bi$).**

Solution

$$(6 + 9i) \cdot (4 - 2i)$$

$$24 - 12i + 36i - 18i^2$$

$$24 - 12i + 36i + 18$$

$$24 + 18 - 12i + 36i$$

$$42 + 24i$$

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3. **Write function $f(x) = x^3 + x^2 - 32x - 60$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	1	-32	-60
6		6	42	60
	1	7	10	0

$$f(x) = (x-6)(x^2+7x+10)$$

$$f(x) = (x-6)(x+5)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+6)^2 \cdot (x+2) \cdot (x-1) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.